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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/738,626	12/18/2000	Satoshi Nakagawa	249-125	2229

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EXAMINER	
LY, CHEYNE D	

ART UNIT	PAPER NUMBER
1631	11

DATE MAILED: 11/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Offic Action Summary	Application No.	Applicant(s)	
	09/738,626	NAKAGAWA ET AL.	
	Examiner	Art Unit	
	Cheyne D Ly	1631	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on *8/12/02* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *69-110* is/are pending in the application.

4a) Of the above claim(s) *69-78 and 84-110* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *79-83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *69-110* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 December 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☒ Other: *PTO-948 Attachment* .

DETAILED ACTION

1. The art unit designated for this application has changed. Applicants(s) are hereby informed that future correspondence should be directed to Art Unit 1631.

2. Applicant's election with traverse of Group V, claims 79-83, in Paper No.10, filed August 12, 2002, is acknowledged. The traversal is on the ground(s) that the Examiner to withdraw the restriction requirement and examine all the claimed subject matter. This is not found persuasive because Applicant fails to set forth arguments that would support the traversal.

3. Sequence election for Group V has been withdrawn.

4. The requirement is still deemed proper and is therefore made FINAL.

5. Claims 79-83 are examined on the merits.

Drawings

6. Applicant is hereby notified that the required timing for the correction of drawings has changed. See the last 6 lines on the sheet which is attached entitled "Attachment for PTO-948 (Rev. 03/01 or earlier)". It is noted that a PTO Form 948 is mailed herewith. Due to the above notification Applicant is required to submit drawing corrections within the time period set for responding to this Office action. Failure to respond to this requirement may result in abandonment of the instant application or a notice of a failure to fully respond to this Office action.

Specification

7. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed. The title of "Novel Polynucleotides" which does not fully describe the claimed invention that is drawn a system and method for

identifying a target sequence. It is suggested that Applicants consider a new title such as "A System and Method for Identifying Target Sequence or A Target Structure Motif."

8. The disclosure is objected to because of the following informalities: The text in pages 18-24 is not legible. Appropriate correction such as replacing pages 18-24 is required.

9. The disclosure is objected to because it contains an embedded hyperlink and/or other form of browser-executable code (Page 349, Line 25). Applicant is required to delete the embedded hyperlink and/or other form of browser-executable code, or inactivate the hyperlink. See MPEP § 608.01.

LACK OF ENABLEMENT UNDER 35 U.S.C. § 112, FIRST PARAGRAPH

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

1. Claims 79-83 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for homology search for adenosine deaminase, glycine cleavage enzyme or dehydrogenase amino acid sequences using Corynebacterium glutamicum genome amino acid sequences database (Example 5, Page 347), does not reasonably provide enablement for the genus *Brevibacterium* or other specific microorganisms as listed in the preamble of claim 79 and thereof or a system and method for determining a function of a polypeptide. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to predictably make and use the invention commensurate in scope with these claims.

2. Factors to be considered in determining whether a disclosure would require undue experimentation have been summarized in Ex parte Forman, 230 USPQ 546 (BPAI 1986) and reiterated by the Court of Appeals in In re Wands, 8 USPQ2d 1400 at 1404 (CAFC 1988). The factors to be considered in determining whether undue experimentation is required include: (1) the quantity of experimentation necessary, (2) the amount or direction presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims. The Board also stated that although the level of skill in molecular biology is high, the results of experiments in genetic engineering are unpredictable. While all of these factors are considered, a sufficient amount for a prima facie case is discussed below.

3. Specific to the genus *Brevibacterium* or other specific microorganisms as listed in the preamble of claim 79 and thereof, the specification, while being enabling for homology search for adenosine deaminase, glycine cleavage enzyme or dehydrogenase amino acid sequences using Corynebacterium glutamicum genome amino acid sequences database (Example 5, Page 347), does not reasonably provide enablement for identifying a target sequence or a target structure motif derived from the genus *Brevibacterium* or other specific microorganisms as listed in the preamble of claim 79 and thereof. The specification discloses that target sequence identities were established by their homology to sequences in the GenBank database or other well-known databases in the art (Page 128, Lines 11-25). Table 1 (Pages 130-317) lists the SEQ ID Nos, percent similarities, and homologous gene names for each respective target sequence. The percent of identity, a criteria used for attributing sequence identity, of homologous sequences ranges from 30% for SEQ ID NO:2955 to 100% for SEQ ID NO:3044. Since this is

not a direct comparison to the Genbank database sequences, it would be speculative at best for one skilled in the art to be able to use the method and system disclosed in this instant case to identify a sequence that is homologous to a target sequence, which is 30% identity to a Corynebacterium glutamicum sequence in the Genbank database. The method and system of this instant case rely on data that are few steps away from the actual sequence being used for identifying sequences. Therefore, it is unreasonable to expect one skilled in the art to use the information disclosed to make and use the inventions to conclusively predict query sequence identity without undue experimentation.

4. Specific to a system and method based on a computer for determining a function of a polypeptide encoded by a polynucleotide having a target nucleotide sequence, the specification, while being enabling for homology search for adenosine deaminase, glycine cleavage enzyme or dehydrogenase amino acid sequences using Corynebacterium glutamicum genome amino acid sequences database (Example 5, Page 347), does not reasonably provide enablement for the determining a function of a polypeptide. As disclosed by the Applicants in Example 5 (Page 350), the said system and method rely solely on homology search results and accompanying annotation data to attribute function to a target sequence. Currently, there is strong evidence within the art that refutes the reliability of the use homology search results to confer function to a target sequence. "Sequences are homologous if they are related by divergence from a common ancestor. Conversely, analogy relates to the acquisition of common structural or functional features via convergent evolution from unrelated ancestors. For example, βbarrels occur in soluble serine proteases and integral membrane porins, but despite their common architecture, they share no sequence or functional similarity. Similarly, the enzymes chymotrypsin and

subtilisin share groups of catalytic residues with almost identical spatial geometries, but they have no other sequence or structural similarities" (Attwood, 2000, Page 472, Column 1, Lines 28-46). Further, the unreliability of predicting function based on similar sequences could be attributed to numerous annotation errors (Attwood, 2000, Page 472, Column 2, Lines 9-10). Therefore, a method or a system that contain steps that is based on unreliable data would require sufficient guidance and direction in determining a function of a polypeptide encoded by a polynucleotide having a target nucleotide sequence to enable a person of ordinary skill in the art to make and use the invention without requiring undue experimentation.

INDEFINITENESS UNDER 35 U.S.C. § 112, SECOND PARAGRAPH

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 79-82 are rejected under 35 U.S.C. 112, second paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

7. The phrase "coincident with or analogous to" (Claims 79 and 81 Step (iii), 80 and 82 Step (iv)) is vague and indefinite because it does not clarify the limitation of the claims. What criteria are being applied to judge whether a sequence is "coincident with or analogous to" a target sequence? Also, this phrase is used to describe the relationships of target sequence and target structure motif to their respective sequences determined by the comparator. Are the same criteria being applied to a sequence for it to be considered as "coincident with or analogous to" a target sequence or target structure?

8. The recitation of the comparator that compares target sequence to sequences in the data storage (Claims 79-82 Step (iii)) is vague and indefinite because it is unclear how one compares an amino acid target sequence to a nucleotide target sequence or vice versa without intervening steps of converting the sequence to a uniform format.

9. The goal of the preamble (Claims 79-82) is to identify a target sequence or a protein function, however, the active steps to a method or the supporting steps to a system do not provide a means of achieving such goal. Thus, the instant claims are unclear as to whether the preamble of the actual claim steps control the metes and bounds of the claims. In other words, would someone infringe the claims by simply performing the claim steps without performing what the preamble states? Clarification of the metes and bounds of the claims via clearer claim wording is requested.

Claim Rejections - 35 USC § 102

10. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

11. Claims 79-83 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Mewes et al. (1998).

12. The above publication Mewes et al. (1998) discloses a computer-based system that contains a gene sequence database is accessible by a user input device for "receiv[ing] detailed information on a yeast gene or protein by search with accession numbers, systematic cods, or gene names"

(Page 34, Column 2, Lines 21-23). This system is used by users to perform the following operations (Page 34, Lines 22-39):

- receive detailed information on a yeast gene or protein by searching with accession numbers, systematic codes, or gene names
- receive up-to-date genetic, biochemical, physiological and structural information for each ORF
- search for human homologues (ESTs)
- visualize whole chromosomes or selected regions to inspect genetic elements, such as ORFs, tRNAs etc.
- download nucleic-acid or protein sequence data
- inspect the yeast genome for gene redundancy
- browse tables of all yeast RNA elements
- browse tables with special features
- browse yeast genes according to their functional classification
- browse yeast protein complexes and protein families catalogues
- browse all yeast ORFs with EC numbers and PROSITE motifs
- inspect up-to-date sequence homologies and alignments (FASTA database)

13. The computer system is powered by a DEC 4100 Unix system (Page 37, Column 1, Lines 24-25). This system contains MIPS yeast genome database. The yeast genome sequence and its related information is available on CD-ROM (Page 33, Abstract). It does not contain SEQ ID Nos: 1 to 3501 or SEQ ID Nos. 3502 to 3501 of the instant invention; however, the MPEP indicates that such sequence located in within a data storage means its nonfunctional descriptive material as cited in MPEP § 2106 (IV)(B)(b). Mewes et al. uses a comparator, such as FASTA, for sequence homologies and alignment (Page 34, Column 2, Lines 38-39) and browse all yeast ORFs with EC numbers and PROSITE motifs (Page 34, Column 2, Lines 35-36). Further, the MIPS yeast genome database system provides information on the biochemical and physiological

context of protein function based on MIPS compiled functional catalogue (Page 34, Column 2, Lines 12-14). The results are output on the PEDANT that contains such fields as homologues, functional category and Prosite motif patterns (Page 36, Figure 2). Clearly, the limitations of the instant invention are anticipated by Mewes et al. (1998).

14. NO CLAIM IS ALLOWED.

15. Papers related to this application may be submitted to Technical Center 1600 by facsimile transmission. Papers should be faxed to Technical Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notices published in the Official Gazette, 1096 OG 30 (November 15, 1988), 1156 OG 61 (November 16, 193), and 1157 OG 94 (December 28, 1993) (see 37 CFR § 1.6(d)). The CM1 Fax Center number is either (703) 308-4242 or (703) 305-3014.

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to C. Dune Ly, whose telephone number is (703) 308-3880. The examiner can normally be reached on Monday-Friday from 8 A.M. to 4 P.M.

17. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Woodward, Ph.D., can be reached on (703) 308-4028.

18. Any inquiry of a general nature or relating to the status of this application should be directed to Legal Instruments Examiner, Tina Plunkett, whose telephone number is (703) 305-3524 or to the Technical Center receptionist whose telephone number is (703) 308-0196.

C. Dune Ly
11/15/02

ARDIN H. MARSCHEL
PRIMARY EXAMINER

Attachment for PTO-948 (Rev. 03/01, or earlier)
6/18/01

The below text replaces the pre-printed text under the heading, "Information on How to Effect Drawing Changes," on the back of the PTO-948 (Rev. 03/01, or earlier) form.

INFORMATION ON HOW TO EFFECT DRAWING CHANGES

1. Correction of Informalities -- 37 CFR 1.85

New corrected drawings must be filed with the changes incorporated therein. Identifying indicia, if provided, should include the title of the invention, inventor's name, and application number, or docket number (if any) if an application number has not been assigned to the application. If this information is provided, it must be placed on the front of each sheet and centered within the top margin. If corrected drawings are required in a Notice of Allowability (PTOL-37), the new drawings **MUST** be filed within the **THREE MONTH** shortened statutory period set for reply in the Notice of Allowability. Extensions of time may NOT be obtained under the provisions of 37 CFR 1.136(a) or (b) for filing the corrected drawings after the mailing of a Notice of Allowability. The drawings should be filed as a separate paper with a transmittal letter addressed to the Official Draftsperson.

2. Corrections other than Informalities Noted by Draftsperson on form PTO-948.

All changes to the drawings, other than informalities noted by the Draftsperson, **MUST** be made in the same manner as above except that, normally, a highlighted (preferably red ink) sketch of the changes to be incorporated into the new drawings **MUST** be approved by the examiner before the application will be allowed. No changes will be permitted to be made, other than correction of informalities, unless the examiner has approved the proposed changes.

Timing of Corrections

Applicant is required to submit the drawing corrections within the time period set in the attached Office communication. See 37 CFR 1.85(a).

Failure to take corrective action within the set period will result in **ABANDONMENT** of the application.